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EVALUATION OF THE SOUTHERN PINE BEETLE INFESTATION ON THE NATIONAL FORESTS OF GEORGIA

By

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INTRODUCTION

Aerial sketchmap and ground surveys were conducted on the National Forests of Georgia in July 1976. Aerial sketchmap surveys were also conducted on the Piedmont National Wildlife Refuge and the Hitchiti Experimental Forest. The surveys covered a total of 1,652,997 acres on the Chattahoochee National Forest, 261,644 on the Oconee National Forest, 34,678 on the Piedmont National Wildlife Refuge and 2,914 acres on the Hitchiti Experimental Forest. The Forest Insect and Disease Management Group conducted the surveys to determine the status and trend of southern pine beetle populations in these areas.

The southern pine beetle infestations in Georgia are part of a southwide outbreak involving 13 states. Infestations were first detected on the National Forests of Georgia in 1971.

METHODS

Fifty percent aerial sketchmap surveys[1/] were conducted on the Brasstown, Chattooga, Tallulah, Toccoa, Chestatee, Cohutta, and Armuchee Ranger Districts on the Chattahoochee National Forest; the Uncle Remus and Redlands Ranger Districts on the Oconee National Forest and on the Piedmont National Wildlife Refuge and the Hitchiti Experimental Forest. A portion of the spots detected on the National Forests during the aerial survey phase of the evaluation were examined on the ground to confirm the cause of mortality and determine the level of activity in the infested area. Ground examinations were not conducted on the Piedmont Wildlife Refuge or the Hitchiti Experimental Forest.

1/ Detection of Forest Pests in the Southeast. 1970. U.S.D.A., U.S.F.S., SA, S&PF, Div. of FPM, Pub. S&PF-7, Atlanta, Ga. 51 pp.

TECHNICAL INFORMATION

Insect - Southern pine beetle, Dendroctonus frontalis Zimm.

Hosts - Southern pine beetle is a native forest pest that will attack all species of southern yellow pine and occasionally other conifers as well. The species of southern yellow pines most susceptible to southern pine beetle attack include - Virginia (Pinus virginiana Mill.), shortleaf (P. echinata Mill.), pitch (P. rigida Mill.), and loblolly (P. taeda L.).

Type of Damage - Death of the tree is the result of mining in the cambium by the southern pine beetle as it constructs egg galleries. The beetle also introduces blue stain fungi, Ceratocystis spp., which slow down or block conduction of water in the stem. The size of an infestation may range from a single tree to several thousand trees.

Life Cycle of the Beetle - Southern pine beetles attack in pairs and construct a winding gallery in the cambium. Eggs are deposited in niches along the sides of the galleries. The eggs hatch into whitish grubs that further mine the cambium and then construct cells in the bark where they pupate and change into adults. The new adults then mine through the bark to emerge. The complete life cycle takes about a month during the summer, and as many as four or five generations may be produced annually in the area.

RESULTS AND DISCUSSION

Currently, the only districts with ongoing southern pine beetle control projects are the Brasstown, Chattooga, and Tallulah Ranger Districts on the Chattahoochee National Forest and the Uncle Remus Ranger District on the Oconee National Forest. However, evaluations were conducted on all districts to determine the infestation levels.

Overall, the southern pine beetle populations are declining in Georgia. Spots were small, averaging 2-3 trees per spot. Although there were some small spots scattered throughout the districts, most of the spots were concentrated in particular areas as shown in Figure 1 on the Chattahoochee National Forest and in Figure 2 on the Oconee National Forest.

Tables 1-3 summarize the results of this evaluation for those districts with southern pine beetle control projects.

The following is a narrative discussion of the southern pine beetle situation on each National Forest.

Chattahoochee National Forest

The southern pine beetle infestation has decreased substantially during the past year. None of the spots that were ground checked on the Brasstown, Chattooga, and Tallulah Districts contained actively infested trees. The evaluation last year reported an estimated 30 infested trees per M acres h.t. on the Brasstown District, 11 infested trees per M acres h.t. on the Chattooga District and 9 infested trees per M acres h.t. on the Tallulah District. Currently, there is an estimated 245.6 MBF of affected timber on the Chattooga and 85.8 MBF and 9.6 MBF of affected timber on the Tallulah and Brasstown Districts,respectively.

Some scattered small spots were detected on the Armuchee and Chestatee Districts. No spots were detected on the Cohutta District and occasional single tree spots were detected on the Toccoa District. Table 3 includes the estimated number of trees for each of these districts. Whenever possible, spots were checked on the ground to determine southern pine beetle activity. Two spots with currently infested trees were located on the Armuchee District. No actively infested spots were located on either the Chestatee or Toccoa Districts.

Oconee National Forest

Activity has continued on the Uncle Remus District. Fewer spots per M acres h.t. were detected when compared to the 1975 evaluation and spots averaged less than three trees per spot. However, 86 percent of the spots ground checked were actively infested with southern pine beetle. Currently, there are an estimated 24 MBF of infested timber on the district. Most of the spots were located in the eastern portion of the District in an area north of the Mathis Fire Tower extending approximately to the community of Willard.

Very little activity was detected on the Redlands District. Activity has declined substantially during the past year and this trend appears to be continuing. Due to the low number of spots detected, this District was not ground checked.

Piedmont National Wildlife Refuge
and Hitchiti Experimental Forest

Only a few scattered single trees were detected on the Piedmont Wildlife Refuge. None were detected on the Hitchiti Experimental Forest. This follows a continuing trend of declining southern pine beetle activity in the area.

RECOMMENDATIONS

Southern pine beetle populations are low on the Chattahoochee National Forest. This follows a trend of continuing decline in infestation levels in the area. Based on the information obtained for the biological evaluation, the continuing

decline of activity throughout most of the north Georgia area, and the presuppression and suppression activities reported by the districts during the past year, it is recommended that the southern pine beetle projects be terminated on the Brasstown, Chattooga, and Tallulah Districts on the Chattahoochee National Forest.

Information obtained for the biological evaluation and the high percent of currently infested spots indicates that southern pine beetle activity will continue and has the potential for increase on the Uncle Remus District, Oconee National Forest. It is recommended that a southern pine beetle control project continue on the District with the emphasis of suppression efforts being directed to the concentrated area of activity indicated earlier in the report. This District should continue suppression measures in accordance with the southern pine beetle control plans for the National Forests of Georgia and FSM 5250.

REFERENCES

Barber, Larry R. 1975. Evaluation of southern pine beetle infestations on the Oconee National Forest, Piedmont National Wildlife, and Hitchiti Experimental Forest, Georgia. U.S.D.A. For. Serv., SA, S&PF, Forest Insect & Disease Mgmt. Group. Report No. 76-1-4.

Barry, P. J. 1975. Evaluation of southern pine beetle infestations on the Chattahoochee-Oconee National Forest, Piedmont Wildlife Refuge and Hitchiti Experimental Forest, Georgia. U.S.D.A. Forest Service, SA, S&PF, Forest Insect & Disease Mgmt. Group. Report No. 76-1-1.

Barry, P. J., R. F. Bassett, and W. E. McDowell. 1976. Evaluation of southern pine beetle infestation on the Chattahoochee National Forest, Georgia. U.S.D.A. Forest Service, SA, S&PF, Forest Insect & Disease Mgmt. Group. Report No. 76-1-19.

Table 1. Summary of the results of the southern pine beetle evaluation conducted on the Chattahoochee National Forest, Georgia, 1976.

	Ownership Unit		
	Brasstown R.D.	Chattooga R.D.	Tallulah R.D.
1. Results compiled from data collected during the aerial phase of the evaluation:			
Survey type	Sketchmap	Sketchmap	Sketchmap
Date of aerial survey	7/22/76	7/21/76	7/21/76
Percent survey	50%	50%	50%
Total acreage surveyed	269,383	214,859	248,383
Total acreage of Forest Service land	105,026	103,466	148,078
Susceptible host type acreage of Forest Service land	12,165	58,535	64,898
Total number of spots within the survey boundary	81	167	271
Total number of spots on Forest Service lands	63	147	247
Spots per M acre of host type Forest Service lands	5.2	2.5	3.8
Average spot size (trees) Forest Service lands	1.8	2.9	3.2
Range of spot sizes (trees) Forest Service lands	1-6	1-15	1-35
Reds and faders/M acres host type on Forest Service lands	9.4	7.4	12.1
2. Results compiled from data collected during the ground and aerial phases of the evaluation:			
Date of ground phase	7/28/76	7/28/76	7/28/76
Infested trees per M acre of host type Forest Service lands	-	-	-
Total number of infested trees on Forest Service lands	-	-	-
Total volume of infested trees on Forest Service lands	-	-	-
Total number of affected trees on Forest Service lands	113	1,526	1,010
Total volume of affected trees on Forest Service lands	9.6 MBF	245.6 MBF	85.8 MBF
Ratio of green infested to total red and fading trees			

Volume - BF - based on Scribner decimal C log rule. Cords converted to bd. ft. based on 500 bd. ft. per cord.

Table 2. Summary of the results of the southern pine beetle evaluation conducted on the Uncle Remus District, Oconee National Forest, Georgia, 1976.

	Ownership Unit
	Uncle Remus R.D.
1. Results compiled from data collected during the aerial phase of the evaluation:	
Survey type	Sketchmap
Date of aerial survey	6/11/76
Percent survey	50%
Total acreage surveyed	176,182
Total acreage of Forest Service land	75,060
Susceptible host type acreage of Forest Service land	72,000
Total number of spots within the survey boundary	196
Total number of spots on Forest Service lands	140
Spots per M acre of host type Forest Service lands	1.9
Average spot size (trees) Forest Service lands	2.9
Range of spot sizes (trees) Forest Service lands	1-20
Reds and faders/M acres host type on Forest Service lands	5.6
2. Results compiled from data collected during the ground and aerial phases of the evaluation:	
Date of ground phase	6/22/76
Infested trees per M acre of host type Forest Service lands	4.1
Total number of infested trees on Forest Service lands	293
Total volume of infested trees on Forest Service lands	24 MBF
Total number of affected trees on Forest Service lands	546
Total volume of affected trees on Forest Service lands	60 MBF
Ratio of green infested to total red and fading trees	1:7

Volume - BF - based on Scribner decimal C log rule. ; Cords converted to bd. ft. based on 500 bd. ft. per cord.

Table 3 -- Summary of Aerial Survey Data - 1/

Southern Pine Beetle Evaluations on the Oconee and Chattahoochee National Forests, Georgia, 1976.

Ownership	Infestation Size (# Trees)										Total	
	2-5		6-20		21-50		50+100		100+			
	Singles	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees	Spots	Trees
Oconee N.F.													
Redlands R.D.	4	4	10	-	-	-	-	-	-	-	-	8	14
*Uncle Remus R.D.	72	46	138	22	192	-	-	-	-	-	-	140	402
Chattahoochee N.F.													
*Brasstown R.D.	38	25	80	-	-	-	-	-	-	-	-	63	113
*Chattooga R.D.	75	63	233	9	128	-	-	-	-	-	-	147	436
*Tallulah R.D.	100	119	351	24	192	4	140	-	-	-	-	247	783
Toccoa R.D.	12	-	-	-	-	-	-	-	-	-	-	12	12
Cohutta R.D.	-	-	-	-	-	-	-	-	-	-	-	-	-
Chestatee R.D.	38	13	32	-	-	-	-	-	-	-	-	51	70
Armuchee R.D.	25	52	137	-	-	-	-	-	-	-	-	77	162

1/ Corrected and expanded to 100 percent.

* Districts with projects.

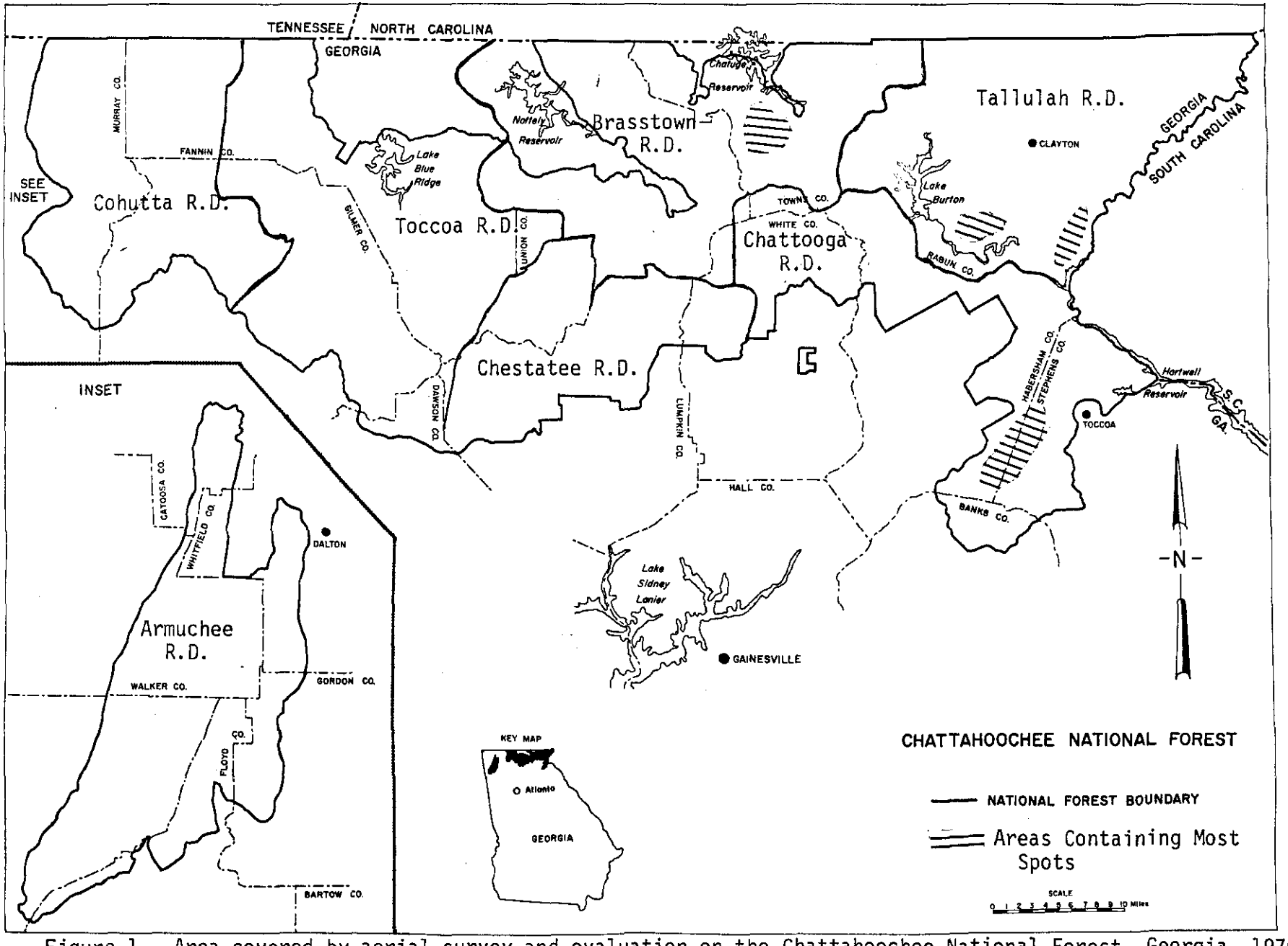

Figure 1. Area covered by aerial survey and evaluation on the Chattahoochee National Forest, Georgia, 1976.

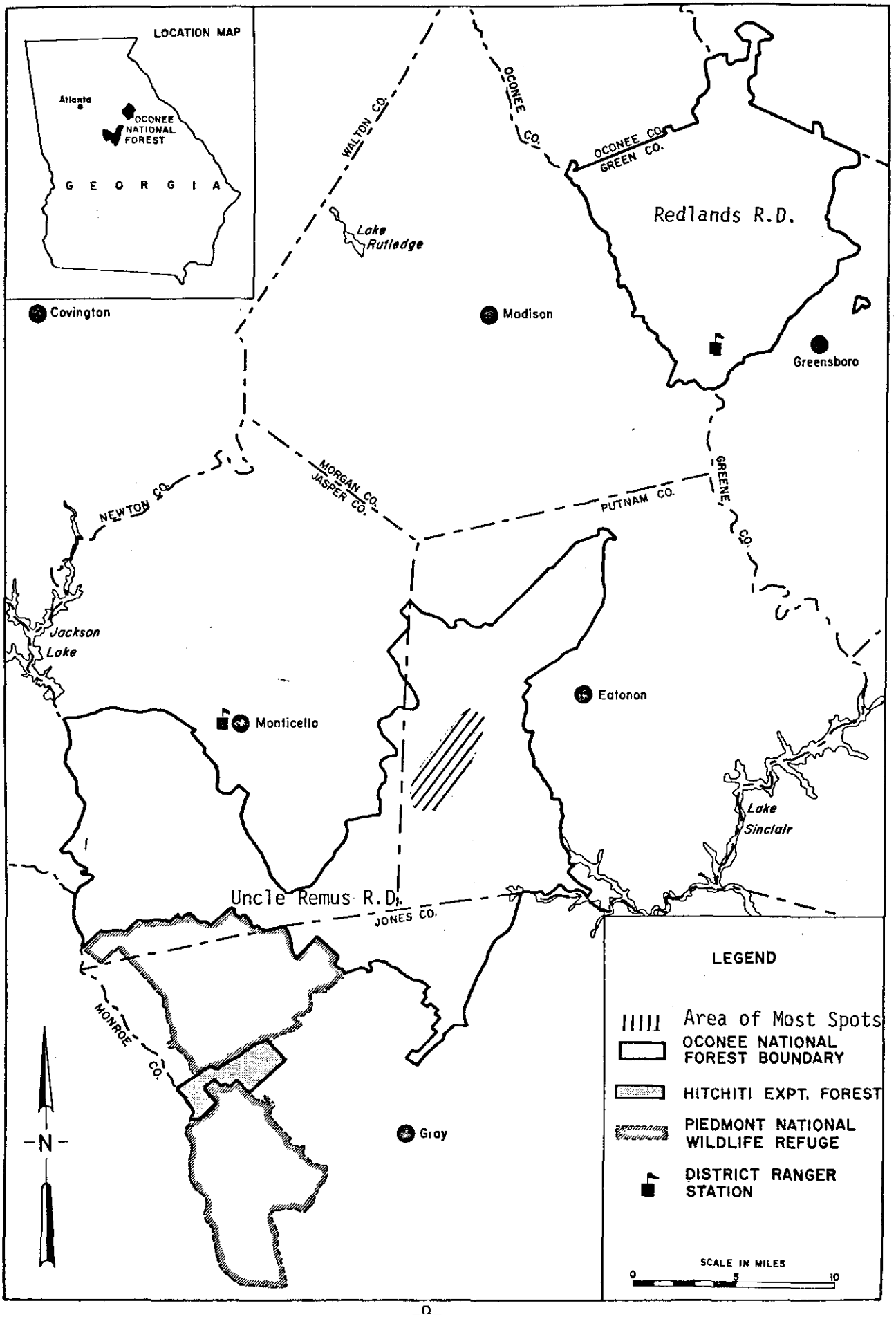

Figure 2. Area covered by aerial survey and evaluation on the Oconee National Forest, Georgia, 1976.